UNITED STATES
TELEPHONE
ASSOCIATION

EX PARTE

March 7, 1997

Mr. William F. Caton, Acting Secretary
Federal Communications Commission
1919 M Street, NW, Room 222
Washington, D.C. 20554

Re: Written Ex Parte Filing
CC Docket No. 96-262

Dear Mr. Caton:

Attached is a written ex parte statement provided by Dr. William E. Taylor of the National Economic Research Associates on behalf of the United States Telephone Association in response to a request from Dr. Joseph Farrell for further information on the welfare effects of long distance entry by an integrated access and long distance provider.

An original and a copy of this written ex parte are being filed in the Office of the Secretary on March 7, 1997. Please include it in the public record of this proceeding.

Respectfully submitted,

Linda Kent

Linda Kent
Associate General Counsel

cc: Dr. Joseph Farrell

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WILLIAM E. TAYLOR
Senior Vice President

March 6, 1997

Dr. Joseph Farrell
Chief Economist
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Dear Joe:

When we met in February, you expressed some concern regarding the effect of vertical integration of a supplier of (bottleneck) local and long distance services when exchange access service was priced above cost. That is, you were concerned that under some conditions, the vertically-integrated firm's profit-maximizing price for the downstream service would be lower—and its market share correspondingly higher—than an equally-efficient firm that specialized in the downstream market.

Attached are our further thoughts on this matter. Using a simple Cournot model and a variety of alternative specifications, consumers benefit more from competition from an integrated provider than they do from a non-integrated provider. For reasonable ranges of values of parameters, social welfare increases with entry as consumers benefit from additional competition in long distance. The majority of the gains to consumers are delivered through declines in the supracompetitive profits received by the long distance incumbents, and, under reasonable conditions, those benefits outweigh the losses from (assumed) inefficient competition.

If you have any questions or would like more information about these results, we would be pleased to talk with you again.

Sincerely yours,

William E Taylor

William E. Taylor

An Analysis of the Welfare Effects of Long Distance Market Entry by an Integrated Access and Long Distance Provider

by
Richard L. Schmalensee,
William E. Taylor,
J. Douglas Zona
and Paul J. Hinton

In the discussion surrounding access charge reform, an objection to setting access prices above cost has been raised, based on the assertion that a firm that supplied both (bottleneck) access and long distance service would have a competitive advantage in the long distance market if access were priced above cost.[1] In particular, Professor Franklin Fisher has suggested that when RBOCs provide both carrier access (at prices above costs) and long distance services, RBOCs would have an "extra" incentive to drive down the price of long distance services, stimulate market demand for long distance in order to increase access profits.[2] In this theory, RBOCs would capture more market share than their relative efficiencies would otherwise dictate so that RBOC supply of long distance services could displace the supply of possibly more efficient long distance rivals, resulting in welfare losses.[3]

This theory has been called a "price squeeze" even though its welfare losses do not arise through a classical anticompetitive price squeeze or a discriminatory treatment of rival long distance providers by raising rivals costs.[4] In Professor Fisher's view, because the long distance market is not perfectly competitive and because an integrated access and long distance service provider (integrated firm)[5] may have effectively lower marginal costs in long distance

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[1] Federal Communications Commission, *Notice of Proposed Rulemaking, Third Report and Order, and Notice of Inquiry*, CC Docket Nos. 96-262, 94-1, 91-213 and 96-263 (released December 24, 1996) at ¶ 47.

[2] Franklin M. Fisher, "An Analysis of Switched Access Pricing And The Telecommunications Act of 1996," at ¶ 31. Others have recognized that the incentives of an integrated carrier access and long distance service provider may differ from those of an unaffiliated long distance carrier. For example in a forthcoming article in the Journal of Policy Analysis and Management, Sibley and Weisman analyze the nature of incentives faced by LECs to discriminate against downstream competitors. Using a simple model of the long-distance market, they find that combined profit maximizing behavior of the LEC in certain circumstances gives them the incentive to lower rather than raise their rivals costs: Sibley, David S. and Dennis L. Weisman, "The Competitive Incentives of Vertically Integrated Local Exchange Carriers: An Economic and Policy Analysis," *Journal of Policy Analysis and Management,* forthcoming Vol. 17, No. 1, 1997.

[3] Relative efficiency is appropriately measured by differences in incremental or marginal costs. This is the standard that we employ.

[4] These forms of anticompetitive behavior are specifically addressed by non-discrimination protections and imputation requirements of the Telecommunications Act of 1996 as well as other safeguards.

[5] By 'integrated firm' we mean one in compliance with separate affiliate and other requirements of the Telecommunications Act of 1996, for which profit maximizing behavior of the affiliates is determined jointly.

than long distance competitors when access charges are set above cost, competition may be distorted in the long distance market.[6]

There is a superficial appeal to the argument: when higher-cost firms displace lower-cost firms, it seems reasonable to expect efficiency losses, holding market price constant. However in the current situation, it is incorrect to hold market price constant; the RBOCs' incentive to stimulate market demand requires a reduction in the market price. That price will be driven down towards the cost of producing long distance minutes—including the cost of access—resulting in a potentially more-than-offsetting increase in welfare. The net change in welfare depends on how many minutes are stimulated by lower prices after entry, the market share of the integrated firm and a host of other details. Currently, prices in the long distance market are significantly above incremental cost,[7] which implies a corresponding loss in economic welfare. Thus the "extra" incentive to reduce long distance prices may increase total welfare by reducing this loss. Professor Fisher has presented the "problem" of potential efficiency losses without explicitly identifying the offsetting effect of consumer surplus gains.

We have analyzed the hypothetical situation that Professor Fisher describes and quantified the relative size of the effects. We conclude that under conditions that reasonably reflect the current characteristics of the long distance market, welfare losses are outweighed by gains in consumer surplus from lower long distance prices. We reach the following general conclusions regarding current telecommunications markets:

- The effect of increased competition from entry far outweighs any potential harm, so that entry by a vertically integrated firm generally makes consumers better off; and

- vertical integration increases benefits rather than decreases them under a wide range of conditions.

I. THE MODEL

We quantify the relative size and extent of the "problem" that Professor Fisher has identified under different access charge, efficiency and competition scenarios. Specifically, we

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[6] The "extra" incentive to lower long distance prices only arises under combined firm profit maximization when access charges are set above short run incremental cost and is generally beneficial to consumers. The specific relationship of access charges to cost – long run incremental, total service long run incremental, total element long run incremental, or some other cost standard – is not relevant to our analysis; in that we compute welfare gains given a fixed level of access charges. Professor Fisher implicitly suggests that setting access charges "at cost" would solve the "problem" caused by the "extra" incentive for price reductions. While setting access prices at incremental cost would eliminate this incentive (and thus, as we show, would generally harm consumers), it would not be desirable to do so. See Statement of Alfred E. Kahn on FCC's Proposed Reforms of Carrier Access Charges, USTA Reply Comment, CC Docket No. 96-262, February 14, 1997.

[7] There is extensive evidence that long distance prices are above incremental costs. See for example Taylor, William E. And J. Douglas Zona, "An Analysis of the State of Competition in Long-Distance Telecommunications Market," *Journal of Regulatory Economics*, forthcoming March, 1997.

assess the likely costs and benefits that arise when an integrated firm maximizes its combined profits rather than permitting each affiliate to independently maximize its own profits. This comparison allows us to examine the nature and relative size of the "advantage" that Professor Fisher argues that RBOCs enjoy from integrated firm operations.[8]

Using a simple model of the long distance and carrier access markets, we investigate the change in total social welfare[9] and consumer surplus associated with these two different profit maximizing assumptions. Modeling imperfect competition is necessarily a delicate art.[10] Ours is not the only possible model of this situation; however, it is the most straightforward one. While the reader should not take too literally the precise parameter ranges for which we find welfare gains and losses, our finding that welfare gains are obtained for wide range of plausible parameter values must be taken very seriously. This finding argues very strongly for a permissive attitude toward RBOC entry into long distance which echoes most economists' prior beliefs in the general efficacy of competition as well as the strongly procompetitive framework of the 1996 Act.

Our model is based on the following structural assumptions. First, we assume market demand can be characterized by a single aggregate demand curve,[11] so that market demand is a function of a single market price.[12] Second, we assume that switched access services are produced using a constant returns to scale technology and carrier access rates are regulated.[13] Third, we assume incumbent long distance competitors are symmetric— all face the same

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[8] Professor Fisher refers to this "advantage" as the "'share stealing' effect", a name which reflects the fact that incumbent long distance providers are likely to lose market share as a result of legitimate competition with RBOCs in the long distance market. *Op cit.* ¶30.

[9] Total social welfare, in economics, is the sum of consumer and producer surpluses.

[10] At the outset it is important to make clear what such a model can and cannot do; because the model is necessarily a simplification of reality, it can only reasonably be used to make general inferences regarding the relative size of effects under demand conditions relatively close to those currently observed.

[11] We use a semi-log demand curve for simplicity and in preference to a linear demand curve because the semi-log function exhibits more stable demand elasticity values over the range of equilibria that we analyze. Wide variations in demand elasticity from the currently observed value are problematic because they stretch the credibility of the model too far. Our analysis with a linear demand curve also supports our general conclusions.

[12] In our base case, the demand elasticity associated with this particular demand curve is -0.8 at 18 cents per minute, which is in the range estimated by the industry. See, e.g.. Taylor, Lester D., *Telecommunications Demand in Theory and Practice*, Kluwer Academic Press: Boston, 1994, p. 144. The figure of 18 cents per minute is consistent with values quoted in the industry. See, e.g. *Ex Parte Presentation in Support of AT&T's Motion for Reclassification as a Nondominant Carrier*, Attachment 1, Letter from C.L. Ward, AT&T, to William F. Caton, FCC, dated February 8, 1995.

[13] In our base case, we have assumed the price of each switched access minute is 3.9 cents. This value is consistent with the numbers published by in *FCC Monitoring Report*, Table 5.11, May 1996, p.474. AT&T economists cite incremental costs of carrier access between 1/3 and ½ cents per minute—we use 0.5 cents. See, e.g., D. Kaserman, J. Mayo, M. Crew, N. Economides, G. Hubbard, P. Kleindorfer and C. Martins-Filho, "Local Competition Issues and the Telecommunications Act of 1996," prepared on behalf of AT&T, July 15, 1996, p. 27. Obviously, prices and costs differ from company to company in the real world.

constant costs associated with non-access inputs.[14] Finally, we assume that profits associated with access and long distance are separable from any other lines of business in which the firms may be operating. In other words, we assume that there are no scale or scope economies associated with the provision of interexchange services and services other than carrier access.

We make the following behavioral assumptions in our model. First, we assume that firms maximize short-run profits. Second, we assume that long distance providers engage in Cournot competition, simultaneously choosing their levels of output while treating other competitors' outputs as fixed.[15] Third, for the vertically-integrated RBOC, we analyze the effects of two different objective functions:

1. the integrated firm maximizes the joint profits from the provision of carrier access services and long distance services;[16] and

2. the long distance affiliate maximizes its own profits independently, given the level of carrier access charges.[17]

It is relatively straightforward to compute the equilibrium associated with the model described above.[18] For a particular set of parameters—demand elasticity, number of incumbent

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[14] In our base case, we have assumed interexchange carriers incur costs of 1.5 cents for each conversation minute, each minute of calling, other than access. See e.g. Lewis J. Perl and Jonathan Falk, "The Use of Econometric Analysis in Estimating Marginal Cost," Presented at Bellcore and Bell Canada Industry Forum, San Diego, California, April 6, 1989, Table 2. We assume that each call requires two switched access minutes.

[15] This behavioral assumption has recently been characterized as reasonable for the long distance industry by economists at the FCC. See *e.g.* Duval, Jerry, Doron Fertig and George Ford, "Market Performance in the Long Distance Telecommunications Industry: The AT&T Non-Dominance Petition," Revised Draft May 8, 1996, p. 2, Footnote 3.

[16] The demand function ($P(Q)$ with demand elasticity "σ") and profit functions for the joint local access and long distance provider (i) and the n identical long distance competitors (j) are:

$$\pi_i = \alpha.Q + q_i.(P(Q) - c_i) - FC_i^{Access} - FC_i^{LD}$$

$$\pi_j = +q_j.(P(Q) - c_j) - FC_j^{LD}$$

$$P(Q) = \frac{\ln(Q) - a}{-b} \quad , \; \sigma \equiv \frac{\delta Q}{\delta p}.\frac{P}{Q} = -b.P$$

The symbol "c" signifies marginal cost of long distance consisting of access charges and transport costs. The symbol "α" signifies access profits per conversation minute. The symbol "Q" represents aggregate output of long distance conversation minutes and "q" firm specific output. The term "FC^{Access}" signifies the fixed costs associated with local network infrastructure and the term "FC^{LD}" signifies the fixed costs associated with long distance network infrastructure.

[17] The relevant profit function for the local exchange company long distance affiliate is derived from the combined firm profit function by eliminating the access profit term. The equilibrium output values in this case are derived in the same way from the equilibrium solution for the combined firm profit maximization solution.

[18] The Cournot equilibrium output solution for the combined firm profit maximization model is characterized by:

long distance competitors, price and cost of carrier access, non-access costs of long distance, and the fraction of calls terminating in region—we compute equilibrium interexchange market prices, market shares, consumer surplus, producer surplus and total welfare. We calibrate the model so that it produces values for a representative customer.[19]

In our base case, we assume no RBOC entry, a semi-log demand curve with an elasticity of -0.8 at 18 cents per minute, four IXC competitors,[20] access priced above cost at $0.039, non-access costs of long distance of 1.5 cents per minute and 60 percent of calls terminating in region.[21] For these parameters, we compute an equilibrium market price of $0.1493 per minute, consumer surplus of $17.44 per line per month and producer surplus of $8.58 per line per month, so that total welfare amounts to $26.02 per line per month.

II. RESULTS OF ENTRY INTO THE LONG DISTANCE MARKET

We use this equilibrium model to measure the welfare effects of two types of entry into the long distance market:

1. relative to the base case, we calculate welfare gains when a vertically integrated firm enters the long distance market, and

2. we calculate welfare gains when a vertically-integrated entrant maximizes joint profits (of access and long distance) relative to when it maximizes long distance and access profits independently.

$$\frac{q_i}{Q} = \frac{1}{n} + b.(\bar{c} - c_i) + \frac{b}{n}.\alpha.(n-1)$$

$$\frac{q_j}{Q} = \frac{1}{n} + b.(\bar{c} - c_j) - \frac{b}{n}.\alpha$$

$$\ln(Q) = a - \frac{1}{n} - b.\bar{c} + \frac{b}{n}.\alpha.$$

The symbol "n" signifies the number of long distance competitors. The symbol "$\bar{c}$ "signifies the mean marginal cost of long distance providers including the local exchange company long distance affiliate. Other symbols are as defined above. To examine the impact of differing relative efficiencies we vary the value of c_i which in turn also affects the value of $\bar{c}$.

[19] Representative values are calculated for a typical customer over a typical month with 68 long distance conversation minutes. See, e.g., *Statistics of Communications Common Carriers*, Federal Communications Commission.

[20] This is a conservative assumption given that an HHI index of industry concentration based on current shares of total access minutes would be over 3,000 implying three or fewer equal sized firms. A market consisting of four equally large firms would have an HHI value of 2,500.

[21] A value of 60 percent is generally larger than the values presented by Bernheim, B. Douglas and Robert D. Willig, "The Scope of Competition in Telecommunications," October 25, 1996.

For a wide range of reasonable parameter values, welfare is higher when an integrated firm enters the long distance market and when it maximizes joint profits rather than access and long distance profits independently.

A. Entry by a vertically-integrated firm increases welfare.

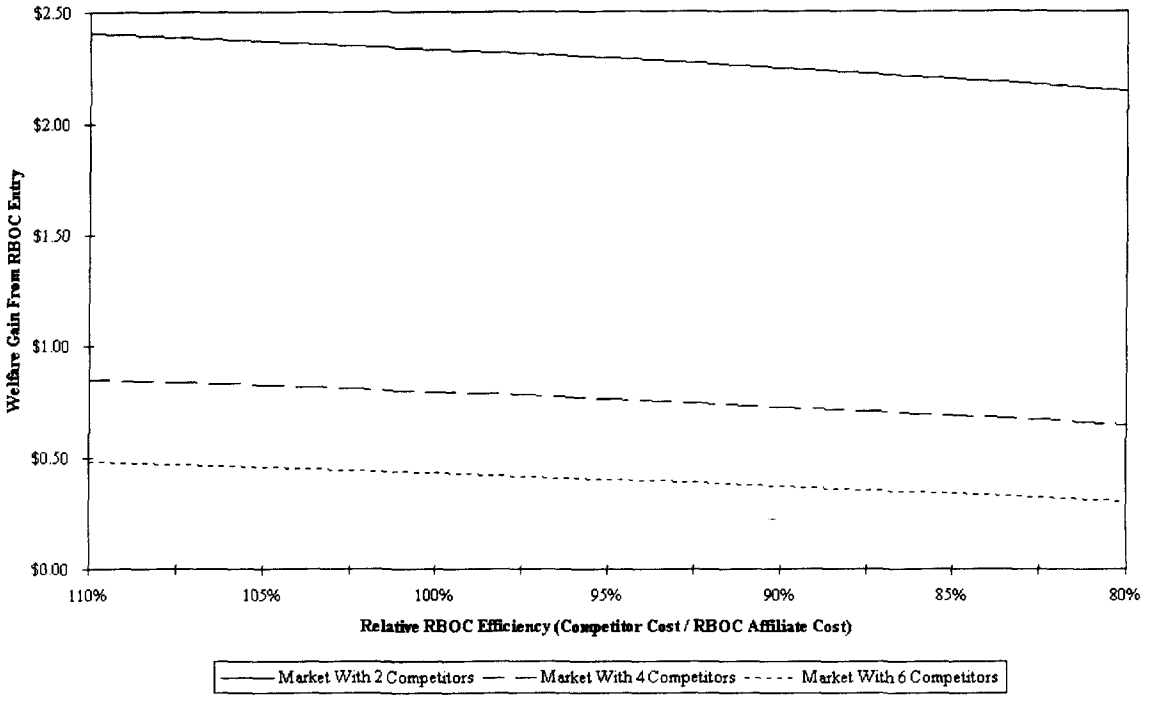
First, welfare is higher when a vertically-integrated firm enters the long distance market even if such entry were to displace a more efficient rival (i.e. the market share of lower-cost rivals declines). Consumers realize benefits from every lower priced minute while efficiency losses arise only from those minutes supplied by the (arguably) less efficient vertically integrated provider.

Chart 1 displays the welfare gain that occurs when an integrated firm enters the long distance market. It shows that under conditions that reasonably reflect the current characteristics of the long distance market, there are positive welfare gains irrespective of hypothetical inefficiencies. The outcomes for a market in which the pre-entry competitive conditions are approximated by Cournot competition between 2, 4 or 6 equally sized competitors are shown. The corresponding HHI market concentration measures are 5,000, 2,500 and 1,667 respectively. The HHI value for the concentration in shares of total access minutes currently observed would be near 3,000.[22] Cartel behavior is represented by the outcome for a market with only one competitor.

The chart presents outcomes assuming levels of RBOC relative efficiency between 110 percent and 80 percent—110 percent indicating that the RBOC is roughly 10 percent (or 0.14 cents) more efficient in long distance (excluding carrier access) and 80 percent indicating that it is roughly 20 percent less efficient (or 0.38 cents) than the long distance incumbents. We consider this a reasonable range of values although we would expect that the RBOCs might in fact be more efficient providers of long distance where they invest in the most modern facilities or use existing in-region infrastructure. While it is possible to generate net welfare gains from entry that are negative, these outcomes require both levels of RBOC inefficiency that are unlikely and levels of long distance competition that evidence suggests do not exist.

[22] The minimum HHI value is associated with the following market shares: AT&T - 50%, MCI - 20 %; Sprint - 10%.

Chart 1
Welfare Gains From RBOC Entry Into Long Distance
Integrated Firm Profit Maximization



Compared with the base case, entry by an integrated firm (maximizing joint profits) causes market price to decrease to $0.1271 per minute, consumer surplus to increase by $1.80 per line per month and producer surplus (in access and long distance combined) to decrease by $1.01 per line per month. The net result of RBOC entry is thus to increase total welfare by $0.80 per line per month.

B. Joint (access and long distance) profit maximization increases welfare.

Second, under conditions that reflect the current characteristics of the long distance market, welfare is generally higher when an affiliated long distance provider acts as part of an integrated firm, rather than independently maximizing profits from access and long distance. This result holds even when more efficient rivals are displaced by the vertically-integrated entrant. In this sense, vertically-integrated firms provide more vigorous competition and greater competitive benefits than do independent affiliated providers.

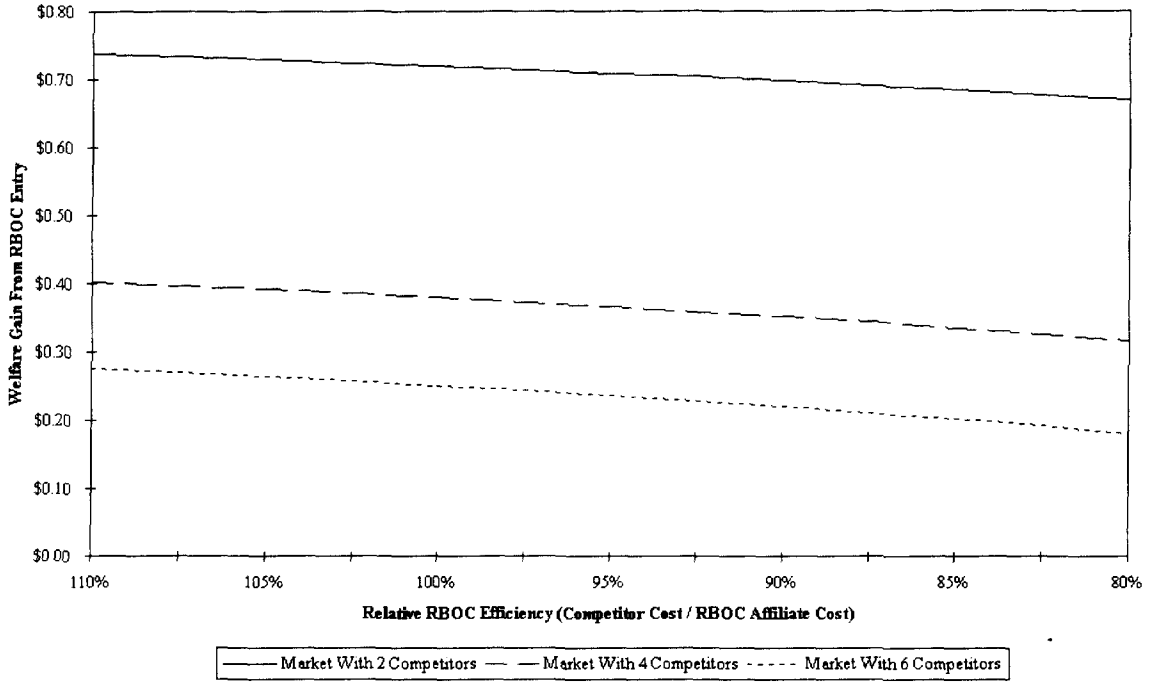
Compared with entry by an integrated firm, entry by an unintegrated firm (maximizing long distance profits and not joint profits) results in a higher market price of $0.1380 per minute, a lower consumer surplus gain of $0.89 per month, and a combined (access and long distance) producer surplus decrease of $0.48 per line per month. The total welfare gain is lower at $0.42 per line per month. Thus entry by an unintegrated firm increases competition to a lesser degree, and reduces long distance profits less than entry by an integrated firm.

Chart 2 displays the additional welfare gain that results when an integrated firm (maximizing joint profits) enters the market, beyond the gains when an unintegrated firm (maximizing profits independently) enters the market. It shows that under conditions that reasonably reflect the current characteristics of the long distance market, there are positive additional welfare gains irrespective of hypothetical inefficiencies. As in Chart 1, it is possible for the welfare gains from integrated firm entry to fall below those for an unintegrated firm, but these outcomes require either levels of inefficiency that are unlikely or levels of current competition that evidence suggests do not exist.

Chart 2

Welfare Gains From RBOC Entry Into Long Distance

Additional Gains When An Affiliated Long Distance Provider Acts As Part Of An Integrated Firm Rather Than Independently



Consumers are always better off when an affiliated long distance provider acts as part of an integrated firm rather than independently, irrespective of relative efficiency.[23] As market concentration decreases and the market performs more competitively, the gains from market entry decline, and the difference between the effects of entry by an integrated and unintegrated firm becomes small.

[23] Gains in Consumer Surplus are never lower with integrated entry. With a semi-log demand curve consumer surplus is linear in market demand, so we prove the proposition by showing that equilibrium output will never be lower under integrated entry compared to unaffiliated entry. The fact that industry output is higher under integrated entry is readily apparent from the equilibrium condition (eliminating the term in α). The term in α is always non-negative.

C. The qualitative benefits from RBOC entry are not very sensitive to the parameters of the model.

We investigate the sensitivity of our results to changes in important parameters that define the characteristics of the market over reasonable ranges. We assess the sensitivity of the model to changes in three assumptions upon which the model is based: (i) the level of access charges, (ii) the fraction of calls that originate and terminate in the same region and (iii) the market price elasticity of demand.

First, of course, if carrier access charges were set equal to cost—and no other prices had to change—the premise of Professor Fisher's problem would disappear. However, given that recovery of some contribution from access charges is efficient, the issue is the effect of that recovery on competition in the downstream market if the carrier access supplier is allowed to enter it. In our model, improvements in consumer surplus and social welfare are affected by changes in the level of contribution in carrier access rates. If access charges were set at short run incremental cost (0.5 cents in our model), the change in consumer surplus and social welfare would converge to the same value under either affiliate-only profit maximization or integrated firm profit maximization. However, the greater the contribution in carrier access, the greater the consumer surplus gain and social welfare gain from entry by an integrated firm.

Second, the additional benefits that entry by an integrated firm delivers in terms of consumer surplus and total welfare gains increase as the fraction of calls that terminate in-region increases.

Third, for a range of reasonable levels of the market price elasticity of demand, welfare gains under integrated firm behavior exceed welfare gains under affiliate-only profit maximization.

III. CONCLUSIONS

This analysis demonstrates that with a simple equilibrium model and a variety of alternative specifications, consumers benefit from entry of a vertically-integrated firm and benefit more when the entrant behaves as an integrated firm rather than an unintegrated firm. For reasonable ranges of values of parameters, social welfare increases with entry as consumers benefit from additional competition which reduces the equilibrium market price of long distance services. The majority of the gains to consumers in these models are delivered through declines in supracompetitive profits received by long distance incumbents, and—for reasonable values of the parameters—such benefits outweigh any possible losses from inefficient competition in the long distance market.